WHAT IS CLAIMED IS:

1.   An automatic transmission control system for an
automobile, comprising:

load computation means for computing *an automobile* load of said
automobile;

output torque estimation means for calculating an
output torque *based on* ~~with reference to~~ torque characteristics of a
drive train of said automobile;

running load estimation means for estimating a
running load from the automobile load and said output
torque;

memory means for storing at least two shift
schedules therein; and

a shift schedule variable-control unit which
determines a shift schedule of an automatic transmission of
said drive train during actual running of said automobile,
on the basis of the estimated running load and the stored
shift schedules.

2.   An automatic transmission control system for an
automobile as defined in Claim 1, wherein said output torque
estimation means calculates said output torque ~~with~~
in response to ~~reference to~~, at least ~~the~~ torque characteristics of a
torque converter of said automatic transmission.

3.   An automatic transmission control system for an

2   automobile as defined in Claim 1, wherein said output torque

3   estimation means calculates said output torque by

4   calculating an output torque of a torque converter of said

5   automatic transmission *in response to* ~~with reference to~~ at least, ~~the~~

6   torque characteristics of ~~said~~ *a* torque converter, and ~~further~~ *by*

7   multiplying the calculated output torque of said torque

8   converter by a gear ratio of a gear stage of said automatic

9   transmission corresponding to a shift instruction.

1   4. An automatic transmission control system for an

2   automobile as defined in Claim 1, wherein said output torque

3   estimation means calculates said output torque *in* ~~with~~

4   *response* ~~reference~~ to, at least, the torque characteristics of a

5   torque converter of said automatic transmission and those of

6   an engine of said drive train.

1   5. An automatic transmission control system for an

2   automobile as defined in Claim 1, wherein said output torque

3   estimation means calculates said output torque by changing-

4   over *between* the torque characteristics of an engine of said drive

5   train and those of a torque converter of said automatic

6   transmission when a ratio between an input revolution speed

7   and an output revolution speed of said torque converter has

8   exceeded a predetermined value.

1   6. An automatic transmission control system for an

2 automobile as defined in Claim 1, further comprising:

3 a neural network which ~~has been supplied~~ receives

4 ~~with values of~~ values of at least a throttle valve opening and

5 an acceleration so as to learn values of a vehicle weight

6 corresponding to the ~~supplied values~~ values supplied beforehand;

7 said load computation means, ~~being~~ comprising vehicle weight

8 estimation means for estimating said vehicle weight of said

9 automobile; and

10 said vehicle weight estimation means estimating

11 said vehicle weight by time-serializing each of, at least,

12 said throttle valve opening and said acceleration and then

13 supplying resultant time-serial signals to said neural

14 network.

1 7. An automatic transmission control system for an

2 automobile as defined in Claim 6, wherein said vehicle

3 weight estimation means supplies said time-serial signals of

4 said throttle valve opening and said acceleration at a

5 timing at which said throttle valve opening has exceeded a

6 predetermined value and at which said acceleration has also

7 exceeded a predetermined value.

1 8. An automatic transmission control system for an

2 automobile as defined in Claim 1, wherein said shift

3 schedule variable-control unit varies a speed change line of

4 said automatic transmission continuously in ~~dependency on~~ response to

5   said running load.

1   9. An automatic transmission control system for an

2   automobile as defined in Claim 1, wherein said shift

3   schedule variable-control unit varies a speed change line of

4   said automatic transmission continuously in ~~dependency on~~, response to

5   at least, a vehicle weight of said automobile.

1   10. An automatic transmission control system for an

2   automobile as defined in Claim 1, wherein said shift

3   schedule variable-control unit varies a speed change line of

4   said automatic transmission continuously in ~~dependency on~~ response to an

5   inclination angle of the ~~running~~ automobile when it is in motion, and a vehicle

6   weight of said automobile.

1   11. An automatic transmission control system for an

2   automobile as defined in Claim 1, wherein said shift

3   schedule variable-control unit varies a speed change line of

4   said automatic transmission continuously in ~~dependency on~~ response to an

5   inclination angle of the ~~running~~ automobile when it is in motion, a vehicle

6   weight of said automobile, and a request for an accelerating

7   operation made by a driver of said automobile.

1   12. An automatic transmission control system for an

2   automobile as defined in Claim 1, wherein:

3   said load computation means ~~is~~ comprises vehicle weight

4   estimation means for estimating a vehicle weight of said

5   automobile;

6   said vehicle weight estimation means includes

7   acceleration input means for ~~accepting~~ receiving an acceleration

8   signal;

9   said running load estimation means estimates

10   said running load from the estimated vehicle weight, the

11   calculated output torque and the ~~accepted~~ received acceleration; and

12   said shift schedule variable-control unit ~~is~~ gear

13   position determination means for selecting one of said shift

14   schedules in accordance with said estimated vehicle weight

15   and the estimated running load, and for ~~determining~~ selecting a gear

16   position of said automatic transmission in conformity with

17   the selected shift schedule.

1   13.   An automatic transmission control system for an

2   automobile as defined in Claim 12, wherein:

3   said vehicle weight estimation means estimates

4   said vehicle weight of said automobile by accepting a

5   throttle valve opening signal and a vehicle speed signal in

6   addition to said acceleration signal;

7   said torque estimation means estimates said output

8   torque by accepting a revolution speed signal of an engine

9   of said drive train and a turbine revolution speed signal of

10   a torque converter of said automatic transmission; and

11   said running load estimation means estimates said

12 running load from said acceleration signal, said estimated

13 vehicle weight and the estimated output torque.

1   14. An automatic transmission/control system for

2 an automobile as defined in Claim 12, wherein said torque

3 estimation means has a mode in which said output torque is

4 estimated from a turbine revolution speed of a torque

5 converter of said automatic transmission and a revolution

6 speed of an engine of said drive train, and a mode in which

7 said output torque is estimated from a throttle valve

8 opening of said engine and said revolution speed of said

9 engine, said modes being established in ~~dependency on~~ *response to* a

10 revolution ratio of a torque converter of said automatic

11 transmission.

1   15. An automatic transmission control system for an

2 automobile as defined in Claim 12, wherein said running load

3 estimation means estimates said running load by solving an

4 equation of motion on the basis of said vehicle weight,

5 said output torque and said acceleration of said automobile.

1   16. An automatic transmission control system for an

2 automobile, comprising:

3   vehicle weight measurement means for measuring a

4 vehicle weight of said automobile;

5   torque estimation means for estimating an output

6   torque;

7   acceleration input means for ~~accepting~~ *receiving* an

8   *signal* ~~acceleration~~;

9   running load estimation means for estimating a

10   running load from the measured vehicle weight, the estimated

11   output torque and the ~~input acceleration;~~ *received acceleration signal*

12   memory means for storing at least two shift

13   schedules therein; and

14   gear position determination means for determining

15   a shift schedule of an automatic transmission of said drive

16   train during actual running of said automobile, on the basis

17   of said vehicle weight, the estimated running load and the

18   stored shift schedules, and for determining a gear position

19   of said automatic transmission in accordance with the

20   determined shift schedule.

1   ~~21.~~ *17.* An automatic transmission control system for an

2   automobile as defined in Claim 12, further comprising start

3   signal generation means for delivering an acceptance start

4   signal in synchronism with rise of said acceleration signal

5   when said acceleration signal is to be accepted.